Complete Summary

GUIDELINE TITLE

ACR Appropriateness Criteria™ for multiple brain metastases.

BIBLIOGRAPHIC SOURCE(S)

Shaw EG, Gaspar LE, Gibbs FA, Lewin AA, Wharam MD Jr, Larson D, Bloomer WD, Buckley JA, Loeffler JS, Malcolm AW, Mendenhall WM, Schneider JF, Schupak KD, Simpson JR, Gutin PH, Rogers L, Leibel S. Multiple brain metastases. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):1121-8. [27 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Multiple brain metastases

GUIDELINE CATEGORY

Treatment

CLINICAL SPECIALTY

Neurological Surgery
Neurology
Oncology
Radiation Oncology
Radiology

INTENDED USERS

Health Plans
Hospitals
Managed Care Organizations
Physicians
Utilization Management

GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of treatment procedures for patients with multiple brain metastases

TARGET POPULATION

Patients with multiple brain metastases

INTERVENTIONS AND PRACTICES CONSIDERED

1. Whole brain radiotherapy
    - 3000 cGy/10 fractions
    - 2000 cGy/5 fractions
    - 4000 cGy/20 fractions
    - 3750 cGy/15 fractions
    - 5000 cGy/25 fractions
2. Radiosensitizer plus whole brain radiotherapy
3. Stereotactic radiosurgery
    - Stereotactic radiosurgery alone
    - Stereotactic radiosurgery plus whole brain radiotherapy
4. Surgery
    - Excise dominant lesion(s)
    - Excise all lesions

MAJOR OUTCOMES CONSIDERED

- Morbidity or mortality
- Improved care
- Median survival time
- Local control rate
- Improvement in neurologic symptoms

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed literature searches of recent peer-reviewed medical journals, primarily using the National Library of Medicine's MEDLINE database. The developer identified and collected the major applicable articles

NUMBER OF SOURCE DOCUMENTS

The total number of source documents identified as the result of the literature search is not known.

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus (Delphi Method)
Weighting According to a Rating Scheme (Scheme Not Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

One or two topic leaders within a panel assume the responsibility of developing an evidence table for each clinical condition, based on analysis of the current literature. These tables serve as a basis for developing a narrative specific to each clinical condition.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Delphi)

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Since data available from existing scientific studies are usually insufficient for meta-analysis, broad-based consensus techniques are needed to reach agreement in the formulation of the Appropriateness Criteria. Serial surveys are conducted by distributing questionnaires to consolidate expert opinions within each panel. These questionnaires are distributed to the participants along with the evidence table and narrative as developed by the topic leader(s). Questionnaires are completed by the participants in their own professional setting without influence of the other members. Voting is conducted using a scoring system from 1-9, indicating the least to the most appropriate imaging examination or therapeutic procedure. The survey results are collected, tabulated in anonymous fashion, and redistributed after each round. A maximum of three rounds is conducted and opinions are unified to the highest degree possible. Eighty (80) percent agreement is considered a consensus. If consensus cannot be reached by this method, the panel is convened and group consensus techniques are utilized. The strengths and weaknesses of each test or procedure are discussed and consensus reached whenever possible.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria and the Chair of the ACR Board of Chancellors.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

ACR Appropriateness Criteria™

Clinical Condition: Multiple Brain Metastases

Variant 1: 70-year-old man with four newly diagnosed, surgically accessible supratentorial brain metastases on magnetic resonance imaging. Karnofsky Performance Status 50. Untreated T3 N2 adenocarcinoma of lung. Bone/liver metastases also present.

Treatment	Appropriateness Rating	Comments
Whole Brain Radiotherapy		
3000/10	8	
2000/5	7	
3750/15	4	
4000/20	2	
5000/25	2	
Radiosensitizer		
Radiosensitizer plus whole brain radiotherapy	2	

Stereotactic Radiosurgery		
Stereotactic radiosurgery alone	2	
Stereotactic radiosurgery plus whole brain radiotherapy	2	
Surgery		
Excise dominant lesion(s)	2	
Excise all lesions	2	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 2: 50-year-old man, two newly diagnosed, surgically accessible, supratentorial brain metastases on magnetic resonance imaging. Karnofsky Performance Status 90. Primary completely resected (T2 N0 adenocarcinoma of lung). No other systemic metastases.

Treatment	Appropriateness Rating	Comments
Whole Brain Radiotherapy		
3750/15	6	
4000/20	5	
3000/10	4	
2000/5	2	
5000/25	2	
Radiosensitizer		
Radiosensitizer plus whole brain radiotherapy	2	
Stereotactic Radiosurgery		
Stereotactic radiosurgery plus whole brain	8	

radiotherapy		
Stereotactic radiosurgery alone	6	
Surgery		
Excise dominant lesion(s)	5	If dominant lesion is large, is associated with mass effect, and caused midline shift.
Excise all lesions	4	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 3: 50-year-old man, with six newly diagnosed supratentorial brain metastases on magnetic resonance imaging (three surgically accessible, three inaccessible). Karnofsky Performance Status 90. Primary completely resected (T2 N0 adenocarcinoma of lung). No other systemic metastases present.

Treatment	Appropriateness Rating	Comments
Whole Brain Radiotherapy		
3000/10	8	
3750/15	7	
4000/20	4	
2000/5	2	
5000/25	2	
Radiosensitizer		
Radiosensitizer plus whole brain radiotherapy	2	
Stereotactic Radiosurgery		
Stereotactic radiosurgery	2	

Stereotactic radiosurgery plus whole brain radiotherapy	2	
Surgery		
Excise dominant lesion(s)	2	
Excise all lesions	2	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 4: 47-year-old woman with two newly diagnosed, surgically accessible, supratentorial brain metastases on magnetic resonance imaging. Karnofsky Performance Status 80. Two years status-post right modified radical mastectomy and adjuvant chemotherapy for T2 N1 adenocarcinoma of breast. Newly diagnosed pulmonary nodules also present.

Treatment	Appropriateness Rating	Comments
Whole Brain Radiotherapy		
3750/15	8	
3000/10	7	
4000/20	5	
2000/5	2	
5000/25	2	
Radiosensitizer		
Radiosensitizer plus whole brain radiotherapy	2	
Stereotactic Radiosurgery		
Stereotactic radiosurgery plus whole brain radiotherapy	7	
Stereotactic radiosurgery	6	

alone		
Surgery		
Excise dominant lesion(s)	2	
Excise all lesions	2	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Variant 5: 35-year-old woman with two newly diagnosed, surgically accessible, supratentorial brain metastases on magnetic resonance imaging. Karnofsky Performance Status 100. Status-post wide local excision of Clark's level IV melanoma. No other metastases.

Treatment	Appropriateness Rating	Comments
Whole Brain Radiotherapy		
3750/15	6	
3000/10	5	
4000/20	2	
2000/5	2	
5000/25	2	
Radiosensitizer		
Radiosensitizer plus whole brain radiotherapy	2	
Stereotactic Radiosurgery		
Stereotactic radiosurgery alone	8	
Stereotactic radiosurgery plus whole brain radiotherapy	8	
Surgery		

Excise all lesion(s)	6	
Excise dominant lesions	2	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1=Least appropriate 9=Most appropriate		

Summary (Summarized by the National Guideline Clearinghouse)

Whole brain radiotherapy is an effective palliative treatment for patients with multiple brain metastases. About half of these patients experience an improvement in their neurologic symptoms. However, the majority of these patients do not achieve local control and frequently succumb from progressive brain disease. The apparent benefits of surgery need verification in prospective, randomized phase III clinical trials. The benefits of stereotactic radiosurgery have been demonstrated in one randomized study. The Radiation Therapy Oncology Group has an ongoing comparison of whole brain radiotherapy with and without stereotactic radiosurgery in patients with one, two, or three brain metastases measuring ≤4 cm in maximum diameter. Effective radiation sensitizers are needed, because whole brain radiotherapy alone, even in doses of 50 to 54.4 Gy, has not been associated with an improved survival outcome.

CLINICAL ALGORITHM(S)

Algorithms were not developed from criteria guidelines.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based on analysis of the current literature and expert panel consensus.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Whole brain radiotherapy may improve neurologic symptoms.
- Surgery and stereotactic radiosurgery may improve median survival time and rates of local control. The benefits of surgery need verification in prospective randomized phase III clinical trials; the benefits of stereotactic radiosurgery have been demonstrated in one randomized study.

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

An American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Shaw EG, Gaspar LE, Gibbs FA, Lewin AA, Wharam MD Jr, Larson D, Bloomer WD, Buckley JA, Loeffler JS, Malcolm AW, Mendenhall WM, Schneider JF, Schupak KD, Simpson JR, Gutin PH, Rogers L, Leibel S. Multiple brain metastases. American

College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):1121-8. [27 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1999

GUIDELINE DEVELOPER(S)

American College of Radiology - Medical Specialty Society

SOURCE(S) OF FUNDING

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria™

GUIDELINE COMMITTEE

ACR Appropriateness Criteria™ Committee, Expert Panel on Radiation Oncology-Brain Metastases Work Group.

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Names of Panel Members: Edward G. Shaw, MD; Laurie E. Gaspar, MD; Frederic A. Gibbs, MD; Alan A. Lewin, MD; Moody D. Wharam, Jr., MD; David Larson, MD, PhD; William D. Bloomer, MD; Judith A. Buckley, MD; Jay S. Loeffler, MD; Arnold W. Malcolm, MD; William M. Mendenhall, MD; Joseph F. Schneider, MD; Karen D. Schupak, MD; Joseph R. Simpson, MD; Phillip H. Gutin, MD; Lisa Rogers, DO; Steven Leibel, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

The ACR Appropriateness Criteria™ are reviewed after five years, if not sooner, depending upon introduction of new and highly significant scientific evidence. The next review date for this topic is 2004.

GUIDELINE AVAILABILITY

Electronic copies: Available from the American College of Radiology (ACR) Web site.

Print copies: Available from ACR, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on January 30, 2001. The information was verified by the guideline developer as of February 20, 2001.

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